Equilibrium Constants For Acids and Bases in Aqueous Solution

K_a Ionization (or dissociation constant for an acid A (charged or otherwise) = equilibrium constant $[H^+][B^-]/[A]$ for A <===> $H^{+1} + B^{-1}$. Likewise, K_b, the ionization constant (or dissociation constant of a base B = equilibrium constant $[A^+][OH^-]/[B]$ for B<===> $A^{+1} + OH^{-1}$

Acid or Ion	*Equilibrium (all in aqueous solution)*	K_a	pK_a	pK_b	K_b
Perchloric	$HClO_4$ <=====> $H^{+1} + ClO_4^{-1}$	very large	-------	-------	-------
Hydroiodic	HI <=====> $H^{+1} + I^{-1}$	very large	-------	-------	-------
Hydrobromic	HBr <=====> $H^{+1} + Br^{-1}$	very large	-------	-------	-------
Hydrochloric	HCl <=====> $H^{+1} + Cl^{-1}$	very large	-------	-------	-------
Sulphuric	H_2SO_4 <=====> $H^{+1} + HSO_4^{-1}$	very large	-------	-------	-------
Nitric	HNO_3 <=====> $H^{+1} + NO_3^{-1}$	40	1.6	-------	-------
Chromic(VI)	H_2CrO_4 <===> $H^{+1} + HCrO_4^{-1}$	10	1.00	14.00	1.0×10^{-14}
Trichloroethane	CCl_3CO_2H <=> $H^{+1} + CCl_3CO_2^{-1}$	2.3×10^{-1}	0.64	13.36	4.37×10^{-14}
Iodic(V)	HIO_3 <=====> $H^{+1} + IO_3^{-1}$	1.7×10^{-2}	0.78	13.22	6.03×10^{-14}
Oxalic	HO_2CCO_2H <==> $H^{+1} + HOOCCOO^{-1}$	5.4×10^{-2}	1.27	12.73	1.86×10^{-13}
Dichloroethanoic	$CHCl_2COOH$ <==> $H^{+1} + CHCl_2COO^{-1}$	5.0×10^{-2}	1.30	12.70	2.00×10^{-13}
Sulphurous	H_2SO_3 <=====> $H^{+1} + HSO_3^{-1}$	1.5×10^{-2}	1.82	12.18	6.61×10^{-13}
Phosphoric	H_3PO_4 <=====> $H^{+1} + H_2PO_4^{-1}$	1.6×10^{-2}	1.80	12.20	6.31×10^{-13}
Chloric(III)	$HClO_2$ <=====> $H^{+1} + ClO_2^{-1}$	1.0×10^{-2}	2.00	12.00	1.00×10^{-12}
Hydrogen sulphate	HSO_4^{-1} <=====> $H^{+1} + SO_4^{2-}$	1.0×10^{-2}	2.00	12.00	1.00×10^{-12}
Phosphoric(V)	H_3PO_4 <=====> $H^{+1} + H_2PO_4^{-1}$	7.9×10^{-2}	2.10	11.90	1.26×10^{-12}
Iron(III) ion	$Fe(H_2O)_6^{3+}$ <==> $H^{+1} + Fe(H_2O)_5(OH)^{2+}$	6.0×10^{-3}	2.22	11.78	1.66×10^{-12}
Hydrogen telluride	H_2Te <=====> $H^{+1} + HTe^{-1}$	2.3×10^{-3}	2.64	11.36	4.37×10^{-12}
Chloroethanoic	$CH_2ClCOOH$ <==> $H^{+1} + CH_2ClCOO^{-1}$	1.3×10^{-3}	2.89	11.11	7.76×10^{-12}
Citric	$H_3C_6H_5O_7$ <=====> $H^{+1} + H_2C_6H_5O_7^{+1}$	7.1×10^{-4}	3.15	10.85	1.41×10^{-11}
Nitrous	HNO_2 <=====> $H^{+1} + NO_2^{-1}$	7.1×10^{-4}	3.15	10.85	1.41×10^{-11}
Hydrofluoric	HF <=====> $H^{+1} + F^{-1}$	5.6×10^{-4}	3.25	10.75	1.78×10^{-11}
Hydrogen selenide	H_2Se <=====> $H^{+1} + HSe^{-1}$	1.7×10^{-4}	3.77	10.23	5.89×10^{-11}
Methanoic (Formic)	HCOOH <====> $H^{+1} + HCOO^{-1}$	1.6×10^{-4}	3.80	10.20	6.31×10^{-11}
Chromic ion	$Cr(H_2O)_6^{3+}$ <=> $H^{+1} + Cr(H_2O)_5(OH)^{2+}$	1.5×10^{-4}	3.82	10.18	6.61×10^{-11}
Lactic	$C_3H_6O_3$ <=> $H^{+1} + C_3H_5O_3^{-1}$	1.2×10^{-4}	3.92	10.08	8.32×10^{-11}
Barbituric	$HC_4H_3N_2O_3$ <===> $H^{+1} + C_4H_3N_2O_3^{-1}$	9.8×10^{-5}	4.01	9.99	1.02×10^{-10}
Ascorbic	$C_6H_8O_6$ <=====> $H^{+1} + C_6H_7O_6^{-1}$	7.9×10^{-5}	4.10	9.90	1.26×10^{-10}
Benzoic	C_6H_5COOH <==> $H^{+1} + C_6H_5COO^{-1}$	6.3×10^{-5}	4.20	9.80	1.59×10^{-10}
Hydrogen oxalate	$HOOCCOO^{-1}$ <=> $H^{+1} + {}^{1-}OOCCOO^{-1}$	5.4×10^{-5}	4.27	9.73	1.86×10^{-10}
Phenylammonium ion	$C_6H_5NH_3^{+1}$ <=====> $H^{+1} + C_6H_5NH_2$	2.0×10^{-5}	4.70	9.30	5.01×10^{-10}
Ethanoic	CH_3COOH <==> $H^{+1} + CH_3COO^{-1}$	1.7×10^{-5}	4.77	9.23	5.89×10^{-10}
n-Butanoic	C_3H_4COOH <===> $H^{+1} + C_3H_4COO^{-1}$	1.5×10^{-5}	4.82	9.18	6.61×10^{-10}
Propanoic	C_4H_5COOH <==> $H^{+1} + C_4H_5COO^{-1}$	1.3×10^{-5}	4.89	9.11	7.76×10^{-10}
Aluminum ion	$Al(H_2O)_6^{3+}$ <==> $H^{+1} + Al(H_2O)_5(OH)^{2+}$	1.0×10^{-5}	5.00	9.00	1.0×10^{-9}
Dihydrogen phosphite	$H_2PO_3^{-1}$ <===> $H^{+1} + HPO_3^{2-}$	6.3×10^{-7}	6.21	7.79	1.62×10^{-8}
Carbonic	$H_2O + CO_2$ <=====> $H^{+1} + HCO_3^{-1}$	4.5×10^{-7}	6.35	7.65	2.24×10^{-8}
Hydrogen chromate	$HCrO_4^{-1}$ <==> $H^{+1} + CrO_4^{2-}$	3.2×10^{-7}	6.50	7.50	3.16×10^{-8}
Hydrogen sulphide	H_2S <=====> $H^{+1} + HS^{-1}$	8.9×10^{-8}	7.05	6.95	1.12×10^{-7}
Hydrogen sulphite	HSO_3^{-1} <==> $H^{+1} + SO_3^{2-}$	6.2×10^{-8}	7.21	6.79	2.0×10^{-7}
Dihydrogen phosphate	$H_2PO_4^{-1}$ <===> $H^{+1} + HPO_4^{2-}$	6.2×10^{-8}	7.21	6.79	2.0×10^{-7}
Hypochlorous	HClO <=====> $H^{+1} + ClO^{-1}$	3.7×10^{-8}	7.43	6.57	3.0×10^{-7}
Telluric	H_5TeO_6 <=====> $H^{+1} + H_4TeO_6^{-1}$	2.0×10^{-8}	7.70	6.30	5.02×10^{-7}
Hypobromous	HBrO <=====> $H^{+1} + BrO^{-1}$	2.1×10^{-9}	8.68	5.32	4.8×10^{-6}
Boric	H_3BO_3 <=====> $H^{+1} + H_2BO_3^{-1}$	5.8×10^{-10}	9.24	4.76	1.74×10^{-5}
Ammonium ion	NH_4^{+1} <=====> $H^{+1} + NH_3$	5.6×10^{-10}	9.25	4.75	1.78×10^{-5}
Hydrocyanic	HCN <=====> $H^{+1} + CN^{-1}$	4.9×10^{-10}	9.31	4.69	2.04×10^{-5}
Silicic	H_2SiO_3 <=====> $H^{+1} + HSiO_3^{-1}$	1.3×10^{-10}	9.89	4.11	7.69×10^{-5}
Ethane-1,2-diammonium	$C_2H_9N_2^{+1}$ <===> $H^{+1} + CH_3NHCH_2NH_2$	1.3×10^{-10}	9.89	4.11	7.69×10^{-5}

Phenol	C_6H_5OH <=====> $H^{+1} + C_6H_5O^{-1}$	1.28×10^{-10}	9.88	4.12	7.81×10^{-5}
Butylammonium	$C_4H_9NH_3^{+1}$ <===> $H^{+1} + C_4H_9NH_2$	5.0×10^{-11}	10.30	3.70	1.0×10^{-4}
Hydrogen carbonate	HCO_3^{-1} <==> $H^{+1} + CO_3^{2-}$	4.8×10^{-11}	10.32	3.68	2.10×10^{-4}
Hydrogen telluride	$H_4TeO_6^{-1}$ <==> $H^{+1} + H_3TeO_6^{2-}$	1.0×10^{-11}	11.00	3.00	1.0×10^{-3}
Hydrogen peroxide	H_2O_2 <===> $H^{+1} + HO_2^{-1}$	2.4×10^{-12}	11.62	2.38	4.17×10^{-3}
Hydrogen silicate	$HSiO_3^{-1}$ <==> $H^{+1} + SiO_3^{2-}$	1.3×10^{-12}	11.89	2.11	7.76×10^{-3}
Hydrogen phosphate	HPO_4^{-2} <==> $H^{+1} + PO_4^{3-}$	4.4×10^{-13}	12.36	1.64	2.29×10^{-2}
Hydrogen sulphide	HS^{-1} <=====> $H^{+1} + S^{2-}$	1.2×10^{-13}	12.92	1.08	8.3×10^{-2}
Water	H_2O <=====> $H^{+1} + OH^{-1}$	1.0×10^{-14}	14.00	0.00	1.0

Equilibrium Constants for Basic Compounds (or Alkali Ions)

Base or Ion	*Equilibrium (all in aqueous solutions)*	K_b
Lead hydroxide	$Pb(OH)_2$ <=======> $PbOH^{+1} + OH^{-1}$	9.6×10^{-4}
Zinc hydroxide	$Zn(OH)_2$ <=======> $ZnOH^{+1} + OH^{-1}$	9.6×10^{-4}
Silver hydroxide	$AgOH$ <=======> $Ag^{+1} + OH^{-1}$	1.1×10^{-4}
Ammonia	$NH_3(aq) + H_2O$ <=======> $NH_4^{+1} + OH^{-1}$	1.8×10^{-5}
Hydrazine	$N_2H_4 + H_2O$ <=======> $N_2H_5^{+1} + OH^{-1}$	1.7×10^{-7}
Hydroxylamine	$NH_2OH + H_2O$ <=======> $NH_3OH^{+1} + OH^{-1}$	1.1×10^{-8}
Beryllium hydroxide	$Be(OH)_2$ <=======> $Be^{2+} + 2\ OH^{-1}$	5.0×10^{-11}

****Adapted from Tom Stretton's Database (© 1996-2003, 2004 Tom Stretton)**